ADDITIONS TO THE GENUS *ARDISIA* SUBGENUS *GRAPHARDISIA* (MYRSINACEAE)

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ABSTRACT

Revision of the group of species formerly placed in *Zunilia* Lundell revealed that the group is synonymous with *Ardisia* subgenus *Graphardisia* Mez. This paper incorporates those taxa in the subgenus, necessitating further revision of *Graphardisia*, including an emended description of the subgenus, a key to the species and subspecies, along with updated descriptions of the two added taxa and new illustrations for each. Two additional taxa are recognized, including one new combination: *Ardisia verapazensis* subsp. *cucullata* (Lundell) Pipoly & Ricketson. Six binomials are relegated to synonymy within *A. verapazensis* Donn. Sm. *Ardisia hyalina* Lundell [*Zunilia hyalina* (Lundell) Lundell] is excluded from subgenus *Graphardisia*, and placed in subgenus *Ardisia*.

RESUMEN

Una revisión del grupo de especies anteriormente clasificadas dentro del género *Zunilia* Lundell, reveló que *Zunilia* es sinónimo del género *Ardisia* subgénero *Graphardisia* Mez. Se incorporan dichos taxa dentro del subgénero *Graphardisia*, y se incluye una descripción actualizada, una clave para separar todos los taxa, acompañados de dos descripciones actualizadas y nuevas ilustraciones para ellos. Se reconocen dos taxa adicionales, incluyendo la nueva combinación: *Ardisia verapazensis* subsp. *cucullata* (Lundell) Pipoly & Ricketson. Se relegan seis binomios a la sinonimia bajo *A. verapazensis* Donn. Sm.. Se excluye *Ardisia hyalina* Lundell [*Zunilia hyalina* (Lundell) Lundell] del subgénero *Graphardisia*, y se la ubica dentro del subgénero *Ardisia*.

INTRODUCTION

In preparing our treatment of the Myrsinaceae for *Flora Mesoamericana*, we critically reexamined taxa segregated by Lundell from *Ardisia*, including *Gentlea* (Ricketson & Pipoly 1997), *Graphardisia* (Pipoly & Ricketson 1998a), *Chontalesia* and species related to it, now known to belong to the genus *Hymenandra* A. DC. ex Spach. (Pipoly & Ricketson 1999). Since our study of subgenus *Graphardisia* (Pipoly & Ricketson 1998a), it has become

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evident that the taxa comprising the segregate genus *Zunilia* (Lundell 1981) are best placed within *Ardisia* subgenus *Graphardisia*.

In Lundell's description of the genus *Zunilia* (Lundell 1981), he separated it from the genus *Ardisia* based on the following key:

1. Panicles of flowers in corymbs, the mature inflorescences heteromorphic with strongly accrescent elongated pedicels arranged either in whorls or opposite or alternate below the apical corymbs ..... **Zunilia**
1. Panicles of flowers consisting of simple racemes or spikes, the inflorescences with flowers uniformly distributed, either pedicellate or sessile ..... **Ardisia**

However, we noted that Lundell failed to compare or distinguish *Zunilia* from his genus *Graphardisia*. As we studied the group of species assigned by Lundell (1981) to *Zunilia*, we noted their raised or sessile glandular-papillate filaments, the large accrescent, densely and prominently black punctate and punctate-lineate sepals that clasped the developing fruit, the black punctations and punctate-lineations of all abaxial leaf surfaces, the lanceolate, concolorous, apiculate anthers with subapically poricidal dehiscence, and the style 2–3 times longer than the ovary, all features we used (Pipoly & Ricketson 1998a) to define subgenus *Graphardisia*. Therefore, we find it necessary to relegate the genus *Zunilia* to synonymy under *Ardisia* subgenus *Graphardisia*, specifically as an emended concept of *Ardisia verapazensis* Donn. Sm.

NOTES ON KEYS, TAXONOMIC CONCEPTS, TERMINOLOGY

The key is artificial and designed to expedite identification of herbarium specimens. An attempt has been made to emphasize vegetative characters to increase the key's usefulness with sterile material. The respective positions of taxa in the key and correlations with phylogenetic relationships are coincidental. Quantitative and qualitative data presented in keys and descriptions for floral parts and bracts were taken from organs rehydrated from herbarium specimens by boiling in water. Measurements from these range from 10% to 15% greater than those measurements taken directly from dried material. Data regarding stem diameters, inflorescence rachises, pedicels, leaf and fruit shape and size were taken from dried herbarium specimens.

Our concept of subspecies follows that of Pipoly (1987) who defined subspecies as: "groups of populations within a single lineage of ancestor-descendant populations that show variation by unique combinations of plesiomorphies, or homoplasic apomorphies, correlated with biogeography and/or ecology. This rank is primarily used to convey information regarding variation in the life histories of these populations and character state differences hypothesized to be the result of this variation. The subspecific rank in no way attempts to predict speciation events."

Morphological terms in this treatment follow Lindley (1848) and Pipoly (1987, 1992) for the inflorescence, rachis pedicels and floral parts. Descrip-

tion of leaf morphology follows Hickey (1984), trichome description follows Theobald et al. (1984) and basic cell and tissue terminology follow Metcalfe (1984).

TAXONOMIC TREATMENT

Ardisia subgenus **Graphardisia** Mez in Engl., Pflanzenr. IV. 236 (Heft 9):78. 1902; Lundell, Wrightia 3:192–198. 1966. *Graphardisia* (Mez) Lundell, Phytologia 48:139. 1981; Lundell, Phytologia 59:429–433. 1986. Type: *Ardisia opegrapha* Oerst.(lectotype, by Lundell, Phytologia 48:139. 1981).

Zunilia Lundell, Phytologia 49:353. 1981, Syn. Nov. Type: *Ardisia sexpartita* Lundell, Wrightia 3:29. 1962. Zunilia sexpartita (Lundell) Lundell, Phytologia 49:354. 1981.

Subshrubs to *trees*. *Branchlets* mostly terete, glabrous or rarely, glandular-granulose. *Leaves* petiolate; blades membranaceous to subcoriaceous, densely and conspicuously or inconspicuously black (rarely pellucid-) punctate and punctate-lineate, the margins entire to crenulate, rarely sharply and irregularly dentate. *Inflorescence* terminal, uni- to tripinnately paniculate, pyramidal to obpyramidal, rarely globose, the ultimate branches corymbose, at times in high anthotactic spirals and thus appearing umbellate, the rachis often densely and prominently black punctate and punctate-lineate; inflorescence and floral bracts foliaceous, mostly persistent, resembling the vegetative leaves but acropetally reduced in size. *Flowers* with perianth white, pink, lavender or purple, densely and prominently black punctate and punctate-lineate; calyx with sepals free or nearly free, large, accrescent and clasping fruits at maturity; corolla rotate, the lobes imbricate in bud, basally short-connate and sparsely to densely yellow glandular-granulose or papillose within; stamens inserted at corolla tube base, the filaments basally connate to form an inconspicuous tube, the tube free from the corolla tube, the apically free portions of the filaments glabrous or glandular-granulose or glandular-papillate, less than half the length of the anthers, the anthers ovate-lanceolate, linear or lanceolate, prominently apiculate, dehiscent by subapical pores; ovary globose to depressed-globose, the style slender, 2–3 times longer than the ovary, the placenta apiculate, the ovules pluriseriate, biseriate, or apparently uniseriate (few in number and in a very high anthotactic spiral). *Fruit* globose or oblongoid, densely conspicuously punctate and punctate-lineate, usually basally surrounded by persistent, clasping sepals.

Distribution.—Four species with seven subspecies found from Mexico to Bolivia and adjacent Brazil.

Ecology.—Members of the subgenus occur in diverse vegetation types, including wet and pluvial lowland, premontane, montane, and cloud forests.

The subgenus is defined by: 1) glabrous branchlets and inflorescence rachises; 2) dense and prominently raised or conspicuous black, or rarely, reddish-black, punctations or punctate-lineations on all leaf and/or floral parts; 3)

sepals often accrescent and usually clasping the developing fruit; 5) linear-lanceolate, concolorous, apiculate anthers with subapically poricidal dehiscence; and 6) style 2–3 times longer than the ovary. Species of the subgenus are often used for home decoration and for use in Christian churches for religious holidays (Pipoly, pers. obs.).

KEY TO TAXA OF *ARDISIA* SUBGENUS *GRAPHARDISIA*

1. Stoloniferous subshrubs mostly less than 1 (–2) m tall; leaf blade margins sharply and irregularly dentate; corolla tube and filaments yellow glandular-granulose; Ecuador to Bolivia and adjacent Brazil. ..... **A. weberbaueri**
1. Shrubs to small trees (0.5–)2–6(–30) m tall without stolons; leaf blade margins entire, undulate or crenulate; corolla tube yellow glandular-granulose; filaments glabrous or sessile to stalked glandular-papillate; Mexico to Colombia.
   2. Sepals membranaceous, oblong, 4.2–8 mm long, apically broadly rounded to obtuse, hyaline throughout, the margins entire ..... **A. opegrapha**
      3. Inflorescence obpyramidal; leaf blades oblanceolate or rarely obovate, 3.5–7.5(–8) cm wide, 3 or more times longer than wide.
         4. Floral bracts caducous; stamens 5.2–6.5 mm long; filaments 2.5–3 mm long; sepals 5–8 mm long ..... **A. opegrapha subsp. opegrapha**
         4. Floral bracts persistent; stamens 3.8–5 mm long; filaments 1.5–2 mm long; sepals 4.2–5.2 mm long ..... **A. opegrapha subsp. wagneri**
      3. Inflorescence globose; leaf blades elliptic to broadly elliptic (7.5–)8–14.5 cm wide, 2–2.5 times longer than wide. ..... **A. opegrapha subsp. paquitensis**
   2. Sepals chartaceous, ovate, 1.5–3.2(–4.0) mm long, apically acute to rounded, opaque except at margin, the margins subentire to erose.
      5. Corolla lobes ovate, elliptic or lanceolate; filaments glabrous; ovules 13–16; Panama and Colombia ..... A. bartlettii
         6. Sepals 1.5–1.8 mm long; petal lobes 6–6.5 mm long; stamens 3.5–4.8 mm long; style base tapering; tall wet forests. ..... **A. bartlettii subsp. bartlettii**
         6. Sepals 2–2.5 mm long; petal lobes 7–8 mm long; stamens 4.5–5.7 mm long; style base stylopodic; strand vegetation and beach forests. ..... **A. bartlettii subsp. lilacina**
      5. Corolla lobes oblong; filaments sessile- to stalked-glandular-papillate; ovules 22–35; Oaxaca, Mexico to Honduras ..... **A. verapazensis**
         7. Corolla lobes 6.5–6.7 mm long; free portion of filaments 3.3–3.4 mm long; style 3–3.1 mm long; fruit 6.5–9 mm in diam., fruiting style 7–8.6 mm long, usually only the basal portion persistent ..... **A. verapazensis subsp. verapazensis**
         7. Corolla lobes 5.7–5.9 mm long; free portion of filaments 2.6–2.8 mm long; style 5.5–5.9 mm long; fruit 5–6.1 mm in diam., fruiting style 8.8–9.4 mm long, entire style usually persistent ..... **A. verapazensis subsp. cucullata**

Ardisia verapazensis Donn. Sm.

Shrub or *small tree* to 30 m tall, 33 cm DBH. *Branchlets* slender to stout, (3–)5–8 mm in diam., glabrous. *Leaves* with blades membranaceous to

chartaceous, elliptic to oblong or oblanceolate, 7.4–34.5 cm long, 3.2–9.7 cm wide, apically acute to acuminate, basally acute to acuminate, decurrent on the petiole, midrib impressed above, prominently raised below, the secondary veins prominulous above, conspicuous to inconspicuous below, at times prominently reticulate, mostly inconspicuously punctate and punctate-lineate, glabrous, the margins entire, undulate to regularly or irregularly crenulate; petioles canaliculate or marginate, 0.4–1.4 cm long, glabrous. *Inflorescence* terminal, bipinnately paniculate, 4.8–16.2 cm long, 3.9–22.4 cm wide, the rachis glabrous, the branches terminating in corymbs; peduncle 0.9–4.2 cm long; secondary inflorescence bracts early caducous, membranaceous, ovate or oblong, (5.4–)9.9–14.8 cm long, 3.7–4.8 cm wide, apically acute or rounded, otherwise similar to the leaves; floral bracts very early caducous, not leaving detectable scars axillant to pedicel (aborted at primordial stage?), or early caducous, membranaceous, ovate, 0.8–0.9 mm long, 0.7–0.8 mm wide, apically rounded, the midrib inconspicuous, the secondary veins not visible, densely and prominently black punctate and punctate-lineate, the margins hyaline, sparsely glandular-ciliolate; pedicels stout or slender, 0.4–1.8 cm long, accrescent in fruit or not, glabrous. *Flowers* 5(–6)-merous, membranaceous, chartaceous to coriaceous, 8.4–10.2 mm long; calyx with sepals free, broadly ovate, 3.4–4.0 mm long, the lobes 2.7–3.2 mm long, 2.3–3.0 mm wide, apically acute to rounded, conspicuously and prominently punctate and punctate-lineate, sparsely scattered glandular-glandulose within near the base, often sparsely lepidote medially outside, the margins hyaline, erose to entire or subentire, ciliolate with multicellular hairs; corolla rotate, 7.7–9.2 mm long, the tube 1.9–2.5 mm long, the lobes oblong, 5.7–6.7 mm long, 3.3–4.1 mm wide, apically rounded, conspicuously and prominently punctate and punctate-lineate, yellow glandular-glandulose and or papillose at base between corolla lobe and tube junction and above staminal tube, otherwise glabrous; margins entire; stamens 5.9–7.7 mm long, the filaments 3.4–5.0 mm long, united basally into a staminal tube 0.7–1.6 mm long, the apically free portions 2.6–3.4 mm long, 0.5–0.7 mm diam., slender or stout, epunctate, sessile or stalked glandular-papillate, the anthers lanceolate, 3.0–3.2 mm long, 1.2–1.4 mm wide at base, apiculate, basally sagittate, dehiscent by subapical pores; ovary glabrous, the style 3.0–5.9 mm long, slender, inconspicuously punctate and punctate-lineate, glabrous, the ovules 22–35, pluriseriate. *Fruit* globose to depressed-globose, 5–9 mm in diam., style 7–9.4 mm long, persistent at least basally, densely and conspicuously punctate, glabrous.

Within subgenus *Graphardisia, Ardisia verapazensis* is most closely related to *Ardisia opegrapha*, because of its large, foliaceous inflorescence bracts and glandular-papillate filaments.

1a. Ardisia verapazensis Donn. Sm. subsp. **verapazensis, (Fig. 1, 2).** *Ardisia verapazensis* Donn. Sm., Bot. Gaz. 46:113. 1908. *Zunilia verapazensis* (Donn. Sm.) Lundell, Phytologia 49:354. 1981. TYPE: GUATEMALA. ALTA VERAPAZ: In monte silvoso prope Cobán, 1,600 m, Jan 1908 (fl), *H. von Türckheim II2093* (HOLOTYPE: US; ISOTYPES: BR, F 2-sheets, G, GH, MO, NY, US 2-sheets).

Ardisia sexpartita Lundell, Wrightia 3:29. 1962, SYN. NOV. *Zunilia sexpartita* (Lundell) Lundell, Phytologia 49:354. 1981. TYPE: GUATEMALA. QUEZALTENANGO: lower S-facing slopes of Volcán Santa Maria, near San Juan Patzulin, 1,300–1,500 m, 6 Jan 1940 (fl), *J. Steyermark 33608* (HOLOTYPE: LL).

Ardisia escuintlensis Lundell, Wrightia 3:98. 1964, SYN. NOV. TYPE: GUATEMALA. ESCUINTLA: without further locality, without elev., 1942 (fl), *J. Ignacio Aguilar 1679* (HOLOTYPE: F).

Ardisia alba Lundell, Wrightia 3:195. 1966, SYN. NOV. *Zunilia alba* (Lundell) Lundell, Phytologia 49:353. 1981. TYPE: MEXICO. CHIAPAS: Municipio Jitotol, steep wooded slope on bank of Río Hondo, 4 mi N of Jitotol on road to Pueblo Nuevo Solistahuacan, 5,500 ft [1,676 m], 12 Feb 1965 (fl), *D. Breedlove 8962* (HOLOTYPE: LL; ISOTYPES: DS, MICH).

Zunilia ciliata Lundell, Phytologia 58:490. 1985, SYN. NOV. *Ardisia ciliata* (Lundell) Lundell, Phytologia 61:63. 1986, (nomen invalidum). *Ardisia ciliata* (Lundell) Pipoly & Ricketson, Sida 18:512. 1998. TYPE: MEXICO. CHIAPAS: Municipio Ocozocoautla de Espinosa, steep slopes of Cerro del Ocote, 30 km NW of Ocozocoautla, montane rain forest, 1,500 m, 14 Oct 1972 (fl), *D. Breedlove 28973* (HOLOTYPE: LL; ISOTYPES: DS, MEXU, MICH, MO).

Zunilia purpusii Lundell, Phytologia 58:491. 1985, SYN. NOV., non *Ardisia purpusii* Brandeg., Univ. Calif. Publ. Bot. 6:189. 1915. *Ardisia feniana* Lundell, Phytologia 61:64. 1986, (nomen invalidum). *Ardisia feniana* Pipoly & Ricketson, Sida 18:512. 1998. TYPE: MEXICO. CHIAPAS: Mountains near Fenia, without elev., May 1925 (fr), *C. Purpus 100* (HOLOTYPE: US).

Shrub or small tree to 30 m tall, 33 cm DBH. *Branchlets* stout, (3–)6–8 mm in diam. *Leaves* with blades 7.4–34.5 cm long, 3.2–9.7 cm wide, the secondary veins inconspicuous below, the margins entire, undulate to regularly crenulate; petioles marginate, 0.6–1.3 cm long. *Inflorescence* 4.8–16.2 cm long, 3.9–22.4 cm wide; peduncle 1.3–4.2 cm long; secondary inflorescence bracts early caducous, membranaceous, ovate or oblong, (5.4–)9.9–14.8 cm long, 3.7–4.8 cm wide, apically acute or rounded, otherwise similar to the leaves; floral bracts very early caducous, not leaving detectable scars axillant to pedicel (aborted at primordial stage?); pedicels stout, 4–18 cm long, accrescent in fruit. *Flowers* chartaceous to coriaceous, 10–10.2 mm long; calyx 3.7–4.0 mm long, the lobes 2.8–3.0 mm long, 2.6–3.0 mm wide, often lepidote medially without; corolla 9.0–9.2 mm long, the tube 2.4–2.5 mm long, the lobes 6.5–6.7 mm long, 3.8–4.1 mm wide; stamens 7.5–7.7 m long, the filaments 4.8–5.0 mm long, united basally into a staminal tube 1.5–1.6 mm long, the apically free portions 3.3–3.4 mm long, 0.5–0.6 mm diam., slender, scattered yellow stalked or rarely sessile glandular-papillate, the anthers 3.0–3.2 mm long, 1.2–1.4 mm wide at base; style 3.0–3.1 mm

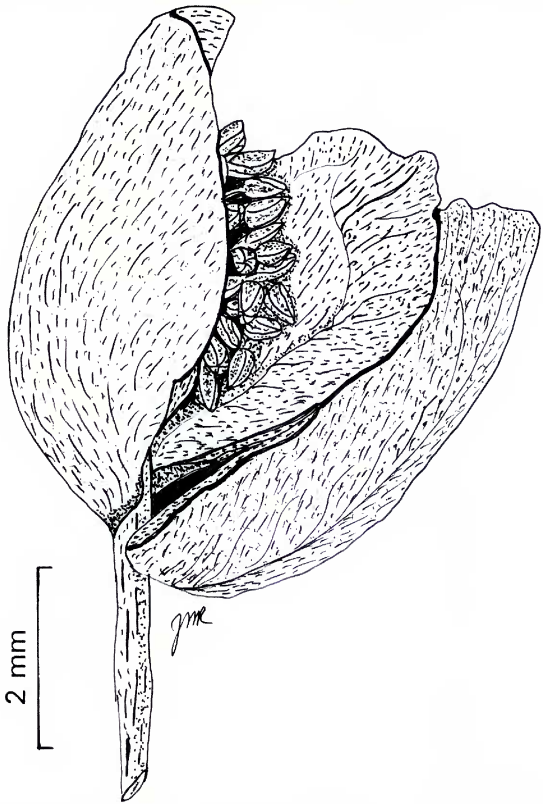

Fig. 1. *Ardisia verapazensis* subsp. *verapazensis*, showing foliaceous secondary inflorescence bracts enclosing the immature inflorescence. Drawn from *A. Méndez Ton 4488* (MO).

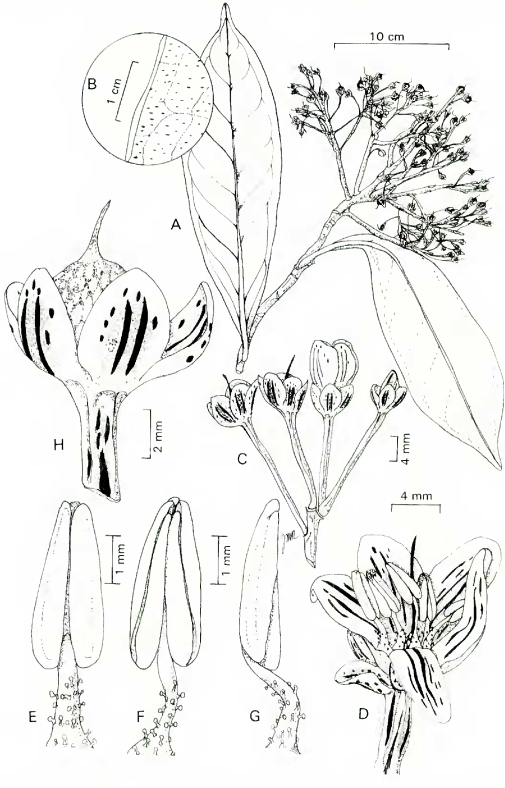

FIG. 2. *Ardisia verapazensis* Donn. Sm. subsp. *verapazensis*. A. Reproductive shoot. B. Detail of abaxial leaf surface. C. Detail of inflorescence. D. Detail of flower. E. Detail of stamens, showing adaxial surface. F. Detail of stamens, showing abaxial surface. G. Detail of stamens, showing laterial surface. H. Fruit. A–H drawn from *H. von Türckheim H.2093* (GH isotype).

long; ovules 22–26. *Fruit* 6.5–9 mm in diam.; style 7–8.6 mm long, usually only basal portion of style persistent.

Distribution.—*Ardisia verapazensis* subsp. *verapazensis* is known from Oaxaca, Mexico through central Chiapas to Guatemala (Alta Verapaz, Quiché, Huehuetenango, Quezaltenango, San Marcos, Suchitepéquez) and with one disjunct population in Copán, Honduras. It grows from 500–3,000 m elevation.

Ecology and conservation status.—*Ardisia verapazensis* subsp. *verapazensis* is known from primary premontane and montane wet forests, and cloud forest margins. It is locally common, but not known to grow in large populations. Given its relatively wide ecological tolerance, this species is not considered threatened at this time.

Etymology.—The epithet 'verapazensis' refers to the type locality, near Cobán, Department of Verapaz (now Alta Verapaz) in northern Guatemala.

Local names.—"Shyash tililja" (Tzeltal), (*A. Méndez T. 4404*); "niwektililjaz" (Tzeltal), *A. Méndez T. 4488*); "b'shyashtililjas," (*A. Shilom T. 7451*); "huesito blanco," (*J. Steyermark 33631*); "palo cruz," (*J. Steyermark 37367*); "camaco," (*T. Hawkins & D. Mejía 241*).

Specimens examined. **MEXICO. Chiapas:** Municipio Berriozábal, 13 km N of Berriozábal near Pozo Turipache and Finca El Suspiro, 900 m, 9 Oct 1971 (fr), *D. Breedlove 20251* (DS, LL, MICH, MO, NY), 1,000 m, 2 Nov 1971 (fr), *D. Breedlove & A. Smith 21680* (DS, LL, MICH, MO), 900 m, 26 Dec 1972 (fr), *D. Breedlove & R. Thorne 30777* (DS, LL, MICH, MO, NY, TEX), 900 m, 15 May 1973 (fr), *D. Breedlove 35294* (DS, LL, MICH, MO, NY), 1,000 m, 10 Oct 1980 (fr), *D. Breedlove & J. Strother 46019* (CAS, LL, MO), 1,020 m, 28 Sep 1988 (fl, fr), *D. Breedlove 70218* (CAS); SE side of Volcán Tacaná above Talquian, 2,200 m, 16 Jan 1973 (fr), *D. Breedlove & A. Smith 31707* (DS, LL, MICH, MO) Cerca de El Suspiro, al NNW de Berriozabal, 900 m, 6 Sep 1953 (fl), *F. Miranda 7887* (DS, US); Municipio Bochil, along the river E of Bochil, 5,200 ft [1,585 m], 27 Jun 1967 (fr), *A. Shilom T. 2574* (DS, F, LL, MICH); Municipio Cintalapa, ridge SE of Cerro Baul on the border of the state of Oaxaca, 16 km NW of Rizo de Oro along a logging road to Colonia Figaroa, 1,600 m, 27 Apr 1972 (fr), *D. Breedlove 24916* (DS), On Oaxaca-Chiapas border near La Cienega de Leon, 1,080–1,230 m, 1 Dec 1980 (fr), *D. Breedlove & F. Almeda 48217* (CAS, GH, LL, NY); Municipio Pueblo Nuevo Solistahuacán, near Clinica Terba Buena, 3 km NW of Pueblo Nuevo Solistahuacán, 1,700 m, 14 Dec 1971 (fr), *D. Breedlove 23201* (DS, MICH, MO), 2.5 mi N of Pueblo Nuevo Solistahuacán, 5,300 ft [1,615 m], 19 Jun 1970 (fr), *E. Lathrop & R. Thorne 7233* (DS), near Clinica Terba Buena, 2 km NW of Pueblo Nuevo Solistahuacán, 5,400 ft [1,646 m], 23–24 Jan 1965 (fr), *P. Raven & D. Breedlove 19918* (DS, F, MICH, US), 3 km NW of Pueblo Nuevo Solistahuacán, on the slopes below Highway 195 in the vicinity of Clinica Yerba Buena, 17° 30" N, 92° 40" W, 5,400 ft (1,646 m), 7 Oct 1971 (fr), *R. Thorne & E. Lathrop 46084* (MICH, NY), 17° 30" N, 92° 40" W, 5,800 ft [1,646 m], 20 Sep 1970 (fl), *H. Zuill 398* (DS); 9 Oct 1970 (fl), *H. Zuill 650* (DS); Municipio Rayón, in the Selva Negra, 10 km above Rayón, Mezcalapa, along road to Jitotol, 1,700 m, 13 Jul 1972 (fr), *D. Breedlove 26072* (DS, LL, MICH, MO, NY), 10 Jan 1981 (fl-bud), *D. Breedlove & B. Keller 49316* (CAS, LL, MO, NY), 9 mi NW of Pueblo Nuevo Solistahuacán along the road between Rincon Chamula and Rayón, slope near Puerto del Viento, 17° 30" N, 93° 40" W, 5,800 ft [1,768 m], Sep 1971 (fl), *R. Thorne & E. Lathrop 41689* (DS); Municipio

San Cristobal de Las Casas, Santa Cruz en San Filipe, without elev., 15 Nov 1986 (fr), *A. Méndez T. & M. C. Martínez. de López 9844* (CAS, MO, NY, TEX); Municipio Tenejapa, near Paraje Yashanal, 2,460 m, 28 Jan 1981 (fr), *D. Breedlove 49645* (CAS); 2,300 m 22 Apr 1981 (fr), *D. Breedlove 51046* (CAS); 1,980 m, 13 Jul 1981 (fr), *D. Breedlove 51463* (CAS, LL); Municipio Tenejapa, Ojo del Río Yashanal, 1,700 m, 10 Jul 1982 (fr), *A. Méndez T. 4404* (MEXU, MO), 20 Aug 1982 (fl-bud), *A. Méndez T. 4488* (MEXU, MO); Municipio Tila, Colonia Kokijaz, 1,000 m, 20 Mar 1983 (fr), *A. Méndez T. 5700* (MEXU, MO), 5 May 1983 (fr), *5965* (MEXU, MO, TEX), Finca Morelia, without elev., 20 Mar 1984 (fr), *A. Shilom T. 7451* (LL, MEXU, MO); Mt. Tacana, 2,000–4,038 m, Aug 1938 (fr), *E. Matuda 2392* (F, GH, LL, MICH, MO, NY, UC, US); Barr. Alpujarrez, without elev., 3 Dec 1941 (fl), *E. Miranda 1746* (MEXU, TEX); Mts. near Fenix, without elev., Apr–May 1930 (fr), *C. Purpus 10100* (GH, NY);. **Oaxaca:** Distrito Ixtlán: Municipio Comaltepec, SW slope of Cerro Relámpago, just above Río Soyolapan, near Federal Electricity Commission Camp, near Highway 175, 17° 29' 15" N, 96° 24' 05" W, 1,750–1,780 m, 3 Dec 1993 (ster.), *E. Boyle et al. 2643* (MO); 15 mi N of San Gabriel along road from Puerto Escondido to Oaxaca, 6,000 ft (1,829 m), 9 May 1965 (fr), *D. Breedlove 9880* (LL), La Esperanza, 17° 37' N, 96° 21' W, ca. 1,600 m, 9 Jan 1988 (fr), *R. López L. & G. Martín 193* (MO), 17° 37' N, 96° 21' W, 1,600 m, 27 Jul 1989 (fl), *R. López L. & G. Martín 491* (MO), Vista Hermosa, trail to camp, 48.8 km SW of Valle Nacional, 17° 39' N, 96° 19' W, 1,460 m, 23 Jan 1988 (fr), *R. Torres C. & L. Cortes 11623* (BRIT, MEXU); Distrito Miahuatlán: Municipio San Jerónimo Coatlán, 18 km NE of Piedra Larga, road to San Jerónimo Coatlán, 16° 09' N, 97° 01' W, 1,950 m, 16 Jan 1988 (fr), *A. Campos V. 957* (F, MEXU, MO), 11.5 km SW of San Jerónimo Coatlán, trail to Piedra Larga, 16° 20' N, 96° 57' W, 2,050 m, 17 May 1988 (fr), *A. Campos V. 1819* (F, MEXU, MO, Espuelas de San Antonio, 13.5 km SW of San Jerónimo Coatlán, trail to Piedra Larga, 16° 12' N, 96° 57' W, 1,950 m, 17 May 1988 (fr), *A. Campos V. 1834* (F, MEXU, MO), 17.9 km SW of San Jerónimo Coatlán, trail to Piedra Larga, 16° 12' N, 96° 58' W, 1,890 m, 17 May 1988 (fr), *A. Campos V. 1853* (F, MEXU, MO), 19.2 km SW of San Jerónimo Coatlán, trail to Piedra Larga, 16° 12' N, 96° 58' W, 1,900 m, 13 Aug 1988 (fl, bud), *A. Campos V. & L. Cortés 2242* (F, MEXU, MO); 6 km NE of logging camp Cerro Sol, trail to Progreso, 16° 11' N, 97° 00' W, 1,400 m, 6 Oct 1988 (fl), *A. Campos V. 2585* (F, MEXU, MO); 20 km W of San Jerónimo Coatlán, 1,680 m, 26 Oct 1982 (fl, fr), *E. Martínez et al. 2501* (BRIT, MEXU); Municipio Valle Nacional, Cerro Mirador, 15 km NNW of Valle Nacional, 17° 93' N, 96° 22' W, 1,000–1,200 m, 15 Oct 1992 (fr), *J. Meave del Castillo et al. 1491* (MEXU, MO); Cafetál Santa Lucía, 1,300 m, 9 Sep 1919 (fl), *B.Reko 441* (US), 20.5 km SW of San Jerónimo Coatlán, trail to Piedra Larga, 16° 12' N, 96° 58' W, 2,000 m, 15 Mar 1989 (fr), *G. Toriz A. & A. Campos V. 818* (F, MEXU, MO); Cerro Baúl, 23 km NE of Rizo de Oro, road to Colonia Rodolfo Figueroa, without elev., 28 Mar 1984 (fr), *R. Torres C. & C. Martínez 4869* (MEXU, MO); 9.6 km SE of Cerro de Vidrio, Oaxaca-Puerto Escondido Highway, 1,850 m, 1 Aug 1984 (fr), *R. Torres C. & C. Martínez 5824* (MEXU, MO); Distrito Mixe, Municipio Totontepec, 10.5 km N of Totontepec, road to Choapán, 17° 17' 00" N, 95° 59' 00" W, 1,760 m, 27 Oct 1988 (fl, fr), *R. Torres C. & L. Cortes 10388* (BRIT, MEXU); Municipio San Miguel Chimalapa, Cerro Salomón, ca. 2 km in straight line NNW of Cerro Guayabitos, ca. 43 km in straight line N of San Pedro Tapanatepec, 16° 45' N, 94° 11' 30" W, 1,850 m, 23 Dec 1985 (fl, fr), *T. Wendt et al. 5149* (BRIT, LL, MEXU); Distrito Sola de Vega, Municipio Santa Cruz Zenzontepec, El Carrizal, 16° 31' 75" N, 97° 26' 06" W, 1,040 m, 14 Apr 1993 (ster.) *J. Weiss 118* (TEX). **GUATEMALA. Alta Verapaz-Quiché:** Chamá to Chihob, 3,000 ft [914 m], 15 Oct 1920 (fl), *H. Johnson 865* (F, LL-fragment, US). **Huehuetenango:** Cerro Huitz, between Mimanhuitz and Yulhuitz, Sierra de los Cuchumatanes, 1,500–2,600 m, 14 Jul 1942 (fr), *J. Steyermark 48602* (F, US).

Quezaltenango: Volcán Zunil, 5,500 ft [1,676 m], 3 Aug 1934 (fl), *A. Skutch 931* (F, GH); Volcán Santa María, between Santa María de Jesús and Calahuaché, along great barranco between Finca Pirineos and San Juan Patzulín, slopes at San Juan, 1,300–1,500 m, 6 Jan 1940 (ster.), *J. Steyermark 33631* (F); Between Quebrada Chicharro and Montaña Chicharro, on SE-facing slopes of Volcán Santa María, 1,300–1,400 m, 18 Jan 1940 (fr), *J. Steyermark 34363* (F). **San Marcos:** Finca Armenia, Rafael de Cuesta, ca, 5,000 ft [1,524 m], 6–7 Jul 1977 (fr), *J. Duyer 14458* (LL, MO); Río Vega, near San Rafael and Guatemala-Mexico boundary, Volcán Tacaná, 2,500–3,000 m, 20 Feb 1940 (fr), *J. Steyermark 36261* (F); Above Finca El Porvenir, up Loma Bandera Shac, lower S-facing slopes of Volcán Tajumulco, 1,300–1,500 m, 9 Mar 1940 (fr), *J. Steyermark 37367* (F, LL); Near Aldea Fraternidad, between San Rafael Pie de la Cuesra and Palo Gordo, W-facing slope of the Sierra Madre Mountains, 1,800–2,400 m, 10–18 Dec 1963 (fl), *L. Williams et al. 25769* (BM, F, UC), *26085* (F, NY), *26278* (F, GH, US); Outer slopes of Tajumulco Volcano, Sierra Madre Mountains about 8–10 km W of San Marcos, ca. 2,300 m, 31 Dec 1964–1 Jan 1965 (fl), *L. Williams et al. 26799* (F, NY, US), (fr), *L. Williams et al. 27188* (F). **Suchitepéquez:** Slopes of Volcán Zunil, vicinity of Finca Las Nubes, along Quebrada Chita, E of Pueblo Nuevo, 500–800 m, 2 Feb 1940 (fl), *J. Steyermark 35431* (F); Volcán Santa Clara, between Finca El Naranjo and upper slopes, 1,250–2,650 m, 23 May 1942 (fr), *J. Steyermark 46650* (F, US). **Without department:** Las Nubes, without elev., Nov 1877 (fl, fr), *K. Bernoulli & A. Cario 1975* (GOET). **HONDURAS. Copán:** S slope of Cerro Azul, 12 km NW of Florida, Cerro Azul National Park, 15° 6' N, 88° 55' W, 1,500 m, 11 Feb 1992 (fr), *T. Hawkins & D. Mejía 241* (EAP, HEH, MO, TEFH).

Ardisia verapazensis subsp. *verapazensis* exhibits great quantitative variation among relative size of its organs within individuals and among populations. Even though its distribution is somewhat restricted, this had led to taxonomic overdescription, much like what Pipoly and Ricketson (1998a) noted for species such as *Ardisia opegrapha* Oerst.

The type of *Ardisia sexpartita* was collected from populations whose inflorescences are smaller than average and whose flowers are more waxy pink than the average. *Ardisia escuintlensis*'s type is a fragmentary collection whose flowers (in bud) have thinner perianth parts, but whose organs otherwise fall well within the size range of variation for the taxon. *Ardisia alba* was described only because of its white flowers and inflorescences that dry almost white, its relatively larger anthers and less conspicuous punctations. The holotype of *Zunilia eciliata*, mostly in fruit, is notable for anthers slightly smaller than the average for the species, and calyx lobe margins that are entire and without glandular cilia. However, reexamination of the MO isotype clearly shows small scattered cilia present on young calyx lobes in bud. *Zunilia purpusii*, whose type is a fruiting collection, was separated by its larger calyx lobes with acutish apices. However, both of these features lie well within the range of variation for the subspecies.

It is notable that Lundell's combinations of *Ardisia eciliata* (Lundell) Lundell and *Ardisia feniana* (Lundell) Lundell are both invalid names. We subsequently validated these names with our combinations *Ardisia eciliata* (Lundell)

Pipoly & Ricketson and *Ardisia feniana* (Lundell) Pipoly & Ricketson (Pipoly & Ricketson 1998b). However, our current studies show that these taxa are clearly synonyms of *Ardisia verapazensis* subsp. *verapazensis*.

1b. Ardisia verapazensis Donn. Sm. subsp. **cucullata** (Lundell) Pipoly & Ricketson, comb. et stat. nov. **(Fig. 3).** *Ardisia cucullata* Lundell, Wrightia 3:26. 1962. *Zuntlia cucullata* (Lundell) Lundell, Phytologia 49:354. 1981. TYPE: MEXICO. CHIAPAS: Frayleseca, near Siltepec, 2,000 m, 7 Mar 1945 (fl), *E. Matuda 5201* (HOLOTYPE: LL; ISOTYPES: F, MEXU).

Zuntlia mirandae Lundell, Phytologia 58:491. 1985, SYN. NOV., non *Ardisia mirandae* Merr., Philipp. J. Sci. 12:154. 1917. *Ardisia neomirandae* Lundell, Phytologia 61:66. 1986, (nomen invalidum). *Ardisia neomirandae* Pipoly & Ricketson, Sida 18:514. 1998. TYPE: MEXICO. CHIAPAS: Finca Prusia, along road from Mapastepec to near Triunfo (S. Jaltenango), without elev., 24 Feb 1951 (fl), *E. Miranda 7004* (HOLOTYPE: MEXU).

Shrub or small trees to 12 m tall. *Branchlets* slender, 3.5–5(–7) mm in diam. *Leaves* with blades 9.2–20.6 cm long, 3.5–8.2 cm wide, the secondary veins conspicuous below, prominently reticulate, the margins entire to undulate, to irregularly crenulate; petioles canaliculate, slender, 0.4–1.4 cm long. *Inflorescence* 6.5–11.5 cm long, 7–15 cm wide; peduncles 0.9–2.5 cm long; secondary inflorescence bracts early caducous, unknown; floral bracts early caducous, membranaceous, ovate, minute, 0.8–0.9 mm long, 0.7–0.8 mm wide, apically rounded, the midrib inconspicuous, the secondary veins not visible, densely and prominently black punctate and punctate-lineate, glabrous, the margins entire, hyaline, sparsely glandular-ciliolate; pedicels slender, 0.8–1.7 cm long, not accrescent. *Flowers* membranaceous, 8.4–8.6 mm long; calyx 3.4–3.9 mm long, the lobes 2.7–3.2 mm long, 2.3–2.5 mm wide, glabrous without; corolla 7.7–7.9 mm long, the tube 1.9–2.1 mm long, the lobes 5.7–5.9 mm long, 3.3–3.5 mm wide; stamens 5.9–6.0 mm long, the filaments 3.4–3.6 mm long, united basally into a staminal tube 0.7–0.9 mm long, the free portion 2.6–2.8 mm long, 0.6–0.7 mm in diam., stalked or rarely sessile glandular-papillate, the anthers, 3.0–3.1 mm long, 1.3–1.4 mm wide at base; style 5.5–5.9 mm, ovules 10–16. *Fruit* 5.0–6.1 mm in diam., style 8.8–9.4 mm long, entire style usually persistent.

Distribution.—*Ardisia verapazensis* subsp. *cucullata* is endemic to the southwestern region of Chiapas, Mexico, around the Sierra Madre de Chiapas and the Area Natural de Reserva El Triunfo. It grows from 700–2,540 m elevation.

Ecology and conservation status.—This subspecies grows in wet montane and cloud forests. Although its geographic range is very restricted, it appears to be common, especially in the Reserva de El Triunfo, where it is presumably protected.

Etymology.—The epithet 'cucullata' refers to what Lundell (1981) interpreted as hooded inner petals. The misinterpretation was based on Lundell's belief that the corolla was fused at the base into a tube, with two larger

Fig. 3. *Ardisia veracruzensis* Donn. Sm. subsp. *cucullata* (Lundell) Pipoly & Ricketson. A. Reproductive branchlet. B. Detail of abaxial leaf surface. C. Detail of inflorescence. D. Detail of stamens, showing adaxial surface. E. Detail of stamens, showing abaxial surface. F. Detail of stamens, showing lateral surface. G. Fruit. A–F drawn from *E. Matuda 5201* (F isotype). G drawn from *R. Hapshire et al. 500* (MEXU).

outer lobes and three inner lobes that were "cucullate" or hooded at the apex. Reexamination of the type revealed that the corolla is simply imbricate and any hooded appearence comes from drying effects.

Specimens examined. **MEXICO. Chiapas:** Municipio Angel Albino Corzo, along Río Cuztepeques, near Finca Cuztepeques, 2,400 ft [732 m], 26 Mar 1968 (fr), *A. Shilom T. 3867* (DS, F, LL 2-sheets, MICH, NY). Municipio Jaltenango, Reserva del Triunfo, Cañada del Pavón NW of Triunfo, 1,800 m, 10 May 1982 (fr), *J. Calzada et al. 8739* (LL), trail NNW from El Triunfo Camp to Palo Gordo Camp, 1 km from El Triunfo Camp, 15° 39' N, 92° 50' W, 2,000 m, 20 Feb 1990 (fr), *R. Hampshire et al. 500* (BM, MEXU), 1–3 km from El Triunfo Camp, 15° 39' N, 92° 50' W, 2,000 m, 21 Feb 1990 (fl, fr), *R. Hampshire et al. 519* (BM 2-sheets, MEXU, NY); trail WSW from Palo Gordo towards Finca Catarina, 15° 40' N, 92° 51' W, 2,000 m, 25 Feb 1990 (fr), *R. Hampshire et al. 699* (BM 2-sheets, MEXU); Municipio Jaltenango-Mapastapec, Reserva El Triunfo, near HQ, 15° 39' N, 92° 48' W, 1,900 m, May 1989 (fr), *M. Heath & A. Long 31* (BM, CHIP), Cañada Honda, near Camp Headquarters, 15° 39' N, 92° 48' W, 1,400 m, May 1989 (fr), *M. Heath & A. Long 40* (CAS, CHIP); Municipio Mapastepec, Area Natural de Reserva El Triunfo, Cañada Honda, 7 km S of camp, 1,500 m, 1 Mar 1990 (fr), *R. Hampshire et al. 1680* (BM 2-sheets, MO), Cañada Honda, 7 km S of camp, 1,500 m, 01 Mar 1990 (fr), *A. Reyes G. et al. 1680* (BM 2-sheets, MO); Municipio Motozintla de Mendoza, steep canyon, SW side of Cerro Mozotal, 11 km NW of the junction of the road to Motozintla along road to El Porvenir and Siltepec, 2,100 m, 22 Nov 1976 (fr), *D. Breedlove 41758* (DS); 23 Nov 1981 (fl), *D. Breedlove & B. Bartholomew 55766* (CAS); Municipio Siltepec, on ridge above Siltepec along road to Huixtla, 2,000–2,400 m, 1 Feb 1982 (fr), *D. Breedlove & F. Almeda 58249* (CAS, LL, MO, NY); Pasitat, without elev., 29 Dec 1936 (fl), *E. Matuda 393* (LL, US); Boquerón, Motozintla, 2,450–2,540 m, 5 May 1945 (fr), *E. Matuda 5416* (F, LL 3-sheets); Mt. Ovando, Escuintla, without elev., 14 Nov 1945 (fl), *E. Matuda 16228* (MO, US).

Zunilia mirandae Lundell is known only from the holotype. It is notable only for its short petioles, smaller inflorescence and smaller sepals, but is otherwise indistinguishable the type of the subspecies.

Subspecies *cucullata* is distinguished from subspecies *verapazensis* by its shorter corolla lobes and free portion of the filaments, the style much longer in flower and fruit, and smaller fruit. It appears to be geographically isolated, occurring only in the southwestern region of Chiapas.

EXCLUDED NAME

Ardisia hyalina Lundell, Wrightia 3:99. 1964. *Zunilia hyalina* (Lundell) Lundell, Phytologia 49:354. 1981. TYPE: MEXICO. SAN LUIS POTOSI: vicinity of Xilitla, Cerro Miramar, 4,400 ft (1,531 m), 15 Jul 1947 (fl), *R.J. Neuman 19* (HOLOTYPE: US).

The ovate anthers with subapical pores, opening into slits, and paniculate inflorescences bearing racemose branchlets, all indicate that this species belongs to *Ardisia* subgenus *Ardisia*, and not subgenus *Graphardisia*.

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NUMERICAL LIST OF TAXA

1a. *Ardisia verapazensis* Donn Sm. subsp. *verapazensis*
1b. *Ardisia verapazensis* Donn. Sm. subsp. *cucullata* (Lundell) Pipoly & Ricketson

LIST OF EXSICCATAE

The figures in parentheses refer to the numbers from the numerical list of taxa. Collection numbers in **boldface** type indicate type specimens.

Bernoulli, K. & A. Cario 1975 (1a); Boyle, B. et al. 2643 (1a); Breedlove, D., **8962** (1a); 9880 (1a); 20251 (1a); 23201 (1a); 24916 (1a); 26072 (1a); **28973** (1a); 35294 (1a); 41758 (1b); 49645 (1a); 51046 (1a); 51463 (1a); 70218 (1a); Breedlove, D. & E. Almeda 48217 (1a); 58249 (1b); Breedlove, D. & B. Bartholomew 55766 (1b); Breedlove, D. & B. Keller 49316 (1a); Breedlove, D. & A. Smith 21680 (1a); 31707 (1a); Breedlove, D. & J. Strother 46019 (1a); Breedlove, D. & R. Thorne 30777 (1a).

Calzada, J. et al. 8739 (1b); Campos V., A., 957 (1a); 1819 (1a); 1834 (1a); 1853 (1a); 2585 (1a); Campos V., A. & L. Cortés 2242 (1a).

Dwyer, J., 14458 (1a).

Hampshire, R. et al. 500 (1b); 519 (1b); 699 (1b); 1680 (1b); Hawkins, T. & D. Mejía 241 (1a); Heath, M. & A. Long 31 (1b); 40 (1b).

Ignacio Aguilar, J., **1679** (1a).

Johnson, H., 865 (1a).

Lathrop, E. & R. Thorne 7233 (1a); López L., R. & G. Martín 193 (1a); 491 (1a).

Martínez, E. et al. 2501 (1a); Matuda, E., 393 (1b); 2392 (1a); **5201** (1b); 5416 (1b); 16228 (1b); 2392 (1a); Meave del Castillo, J. et al. 1491 (1a); Méndez T., A., 4404 (1a); 4488 (1a); 5700 (1a); **5965** (1a); Méndez T., A. & M. C. Martínez. de López 9844 (1a); Miranda, F., 1746 (1a); **7004** (1b); 7887 (1a).

Purpus, C., **100** (1a); 10100 (1a).

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